

AMENDMENTS TO THE CLAIMS

Claim 1 (Currently Amended): An integrated pixel sensor structure comprising:
~~a set of at least three light sensitive diodes, an n-layer placed on top of each of the light sensitive diodes in the set of light sensitive diodes;~~
an i-layer placed on top of the n-layer;
a p-layer placed on top of the i-layer;
a transparent conductor placed on top of the p-layer;
a protective layer ~~placed on top of~~ coupled to the transparent conductor,
a set of separated echelon diffraction grating elements for producing complementary colors and to protect the set of at least three light sensitive diodes, the protective layer disposed between adjacent echelon diffraction grating elements of the set of separated echelon diffraction grating elements, the set of grating elements are placed on top of the transparent conductor, wherein the protective layer is of a sol gel material, the protective layer covers a portion of the transparent conductor not covered by the set of separated echelon diffraction grating elements, and the integrated pixel sensor structure not including a lens.

Claim 2 (Original): The structure of claim 1, where the protective layer includes anti-reflection properties.

Claim 3 (Previously Presented): The structure of claim 1, where each light sensitive diode of the set of at least three light sensitive diodes is compatible with the protective layer and the protective layer is a material suitable for use with metal oxide semiconductor fabrication processes.

Claim 4 (Previously Presented): The structure of claim 1, where the set of separated echelon diffraction grating elements include a set of four step echelon grating elements.

Claim 5 (Currently Amended): A system comprising:
an integrated pixel sensor structure having:
a set of at least three light sensitive diodes;
~~an n-layer layer placed on top of each of the light sensitive diodes in the set of at least three light sensitive diodes;~~

an i-layer placed on top of the n-layer;
a p-layer placed on top of the i-layer;
a protective layer ~~placed on top of~~ ~~coupled to~~ the transparent conductor; and
a set of echelon diffraction grating elements for producing complementary colors and to protect the set of at least three light sensitive diodes, the set of echelon diffraction grating elements placed above the transparent conductor, the protective layer disposed between adjacent echelon diffraction grating elements of the set of echelon diffraction grating elements; and
a post capture signal processing unit coupled to the integrated pixel sensor,
wherein the protective layer is of a sol gel material, the protective layer covers a portion of the transparent conductor not covered by the set of separated echelon diffraction grating elements, and the integrated pixel sensor structure not including a lens.

Claim 6 (Original): The system of claim 5, where the protective layer includes anti-reflection properties.

Claim 7 (Previously Presented): The system of claim 5, where the protective layer is suitable for fabrication processes that are compatible with each light sensitive diodes in the set of at least three light sensitive diodes.

Claim 8 (Original): The system of claim 5, where the set of echelon diffraction grating elements include a set of four step echelon grating elements.

Claims 9-12 (Canceled)

Claim 13 (Currently Amended): A method comprising:
providing a set of at least three light sensitive elements, ~~placing an n-layer above each light sensitive element of the set of at least three light sensitive elements,~~
placing an i-layer above the n-layer,
placing a p-layer above the i-layer;
placing a transparent conductor on top of the p-layer;
placing a protective layer of a sol gel material on top of the transparent conductor, and

a set of echelon diffraction grating elements for producing complementary colors, the protective layer disposed between adjacent echelon diffraction grating elements of the set of echelon diffraction grating elements, wherein the set of echelon diffraction grating elements to protect the set of at least three light sensitive elements, and the set of echelon diffraction grating elements are placed above the transparent conductor,
wherein the protective layer covers a portion of the transparent conductor not covered by the set of echelon diffraction grating elements, and the set of at least three light sensitive elements not including a lens.

Claim 14 (Original): The method of claim 13, where placing the protective layer includes placing a material with anti-reflection properties above the transparent conductor.

Claim 15 (Previously Presented): The method of claim 13, where placing the protective layer includes placing a material suitable for fabrication processes that are compatible with each light sensitive element of the set of at least three light sensitive elements.

Claim 16 (Original): The method of claim 13, where the set of echelon diffraction grating elements include a set of four step echelon grating elements.

Claim 17 (Currently Amended): An integrated circuit die comprising:
an image sensing area of the die having at least three light-sensitive diodes formed above a metalization layer of the die; and
a protective layer of the die, wherein the protective layer is to protect each of the at least three diodes and a plurality of echelon diffraction gratings placed on top of a transparent conductor layer,
the transparent conductor forms a top contact of the at least three light sensitive diodes and wherein the protective layer has a low enough deposition temperature so as not to environmentally stress the transparent conductor, and the protective layer covers a portion of the transparent layer not covered by the plurality of echelon diffraction gratings,
wherein the protective layer is of a sol gel material, and the set of at least three light sensitive diodes not including a lens.

Claim 18 (Previously Presented): The integrated circuit die of claim 17 wherein the at least three diodes have amorphous silicon as their photo-active material.

Claim 19 (Previously Presented): The integrated circuit die of claim 18 wherein each of the at least three diodes has a n-i-p structure.

Claim 20 (Previously Presented): The integrated circuit die of claim 19 wherein each of the n and p portions of the n-i-p structure is thin relative to the i portion.

Claim 21 (Previously Presented): The integrated circuit die of claim 18 wherein the at least three diodes have a transparent conductor made of an indium tin oxide (ITO) layer that forms a top contact of the plurality of diodes.

Claim 22 (Canceled)

Claim 23 (Previously Presented): The integrated circuit die of claim 17 wherein the protective layer has anti-reflective properties to act as an antireflective filter for the image sensing area of the die.

Claim 24 (Previously Presented): The integrated circuit die of claim 17 wherein the echelon diffraction grating is designed to impart RGB color sensing to the image sensing area of the die.

Claim 25 (Previously Presented): The integrated circuit die of claim 17 wherein the protective layer is made of a sol-gel material.

Claim 26 (Previously Presented): The integrated circuit die of claim 17 wherein the at least three diodes and the protective layer are compatible with a metal oxide semiconductor (MOS) fabrication process.